Optimal pricing policy of continental transit route: a study of Kolkata-Agartala transit route

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Abstract**:** *The aim of this paper is to investigate the pricing policy of transhipment route for India to move cargo through Bangladesh from Kolkata port to the capital city of Tripura i.e. Agartala. Initially, Bangladesh was hesitating to allow India to provide transhipment facility for the north eastern region but India reciprocate it in right direction by providing similar facility to Bangladesh to reach the Himalayan landlocked countries like Nepal and Bhutan, thereby, actively participate in moving towards an integrated transport network for this region as a whole. The future opening of Myanmar route further gives some relief to India. Most of the cargo originates from Kolkata (Port) and terminates at Guwahati and distributed to various destinations of north eastern states. We try to investigate the pricing policy of such transhipment route for India in terms of a Bertrand type model with non homogeneous type cargo movement where the unit price of cargo transhipment taken as a proxy for such transhipment route.*

Key Words: Transhipment Route, Bertrand competition, Integrated Transport Network

JEL Classification: R11, R48,D43,C52

1. Introduction:

Before partition[1], Tripura was very much connected with India's hinterland both by roads and railways through the then East Bengal (presently known as Bangladesh). So, no need was felt to connect Tripura with the rest of the states in the northeast[2]. But the partition made Tripura an extreme outpost not only from the heartland of India but also from the north eastern region, too. After partition, Tripura emerged as a mirror image of the whole north eastern region encompassed with ethno-geographic and bio-geographic location. It was land locked- an outpost away from the remaining parts of the country, only connected by tenuous Churaibari corridor. Though it shared some boundary with neighouring Mizoram in the eastern part but smooth transportation was not possible due to the presence of Jampui Hills in Mizoram state border. The remaining boundary is covered by Bangladesh in the whole Western, Southern and maximum

[1] In 1947, August 15, India got independence and bifurcated as India and Pakistan. At that time, Tripura was a Princely state and formally integrated with India on October 15, 1949.

[2] The North Eastern region comprises of seven states viz. Assam, Arunachal Pradesh, Meghalaya, Manipur, Mizoram, Nagaland and Tripura (known as Seven Sisters). Recently, Sikkim is also incorporated into this region.

portion of the Eastern side. Hence, the immediate need was to connect Tripura with the north eastern region. Assam-Agartala road (National Highway-44) project via Churaibari was found to be the only economically viable project. The central government constructed the Assam-Agartala road through the hilly region. As a result, a well-connected native state became an isolated land locked region with its immense geo-strategic importance in the face of political tension between India and Pakistan. Against this background, Tripura is constantly facing the problem of a lack of a smooth transportation and naturally, it is an economic imperative for this landlocked state to seek benefits for itself through greater regional integration. Development of the State requires the existence of viable road network in Tripura so that the transport cost for both inflows and outflows of commodities from Tripura will be cheaper. The State Government of Tripura is continuously demanding for transit route through Bangladesh but they are not ready to implement this because of possible threat of loss. So, the debate on the possibility of a viable road network is relevant for economic progress of the state.

However, it is a fact that the Asian highway project has not covered directly three states of the north eastern region – Tripura is one of them. But the existing Roadway link may fetch the advantage of Asian Highway in accelerating its activity in border trade with countries like China. Moreover, the Asian Highway project may be used more effectively if the demand of Tripura for using the sea port in Bangladesh is granted. The entire trade situation is likely to be changed as a result. Tripura is likely to be the gateway for Tran's border trade not only for India but also for Bangladesh, too.

The area of research which is proposed here is basically an attempt to explore the possibilities of a viable road network which can respond to the demand for communication by people of Tripura as well as the demand of Tripura's projected economy. It requires no mention that Tripura is geographically a sequester land located at the remotest corner of the Country where transportation is relatively a time consuming phenomenon. The north eastern region is connected by land with the rest of India through West Bengal. The surface transport system for movement of cargo/passengers to and from the north eastern states consists of road, rail and waterways. As far as cargo movement is concerned, most of the cargo originates from Kolkata (Port) and terminates at Guwahati and vice-versa. From Guwahati, the cargo gets distributed to various destinations of north eastern states. The transport links to states particularly Mizoram, Tripura,

Manipur and Nagaland are affected many a time by floods, landslides, blockages of roads and local agitations. Apart from that, the stretches and curves of roads in the hilly area does not permit smooth and feasible cargo services in this region. Perhaps, the best example is the Natural Gas based **Palatana**[3] Power plant which is yet to wait some more time, as the present road network within Tripura is not capable of carrying the required machinery of that project. Government of India was seeking permission from the Bangladesh Government to allow their roads for this purpose. Ultimately, in December 2010, a Memorandum of Understanding has been signed between India and Bangladesh to tranship the required heavy machinery through the sea and land route of the latter in phased manner.

The main objectives of this paper is to investigate the pricing policy of transit route for India to move cargo through Bangladesh from Kolkata port to the capital city of Tripura i.e. Agartala keeping in mind the advantage and disadvantage of the existing road network in Tripura as well as future opening of Myanmar route as an alternative transit route via Mizoram state border for north eastern region in general and Tripura, in particular. As such, no such significant work has been found with particular reference to this type of problem for a less developed and geographically sequesters state like Tripura in the Indian context. Hope, this proposed paper will attempt to fill up that caveat.

2. Review of Literature:

Study of the available literature suggests that the effect of transportation investment on economic development comes from the role of transportation facilities in enabling movement and interchange of activities between different locations. The earliest works in regional science recognized that both growth and concentration of economic activity at any given location depends largely on access to markets and the location economies arising out of that access. This is reflected in the works of Marshall (1919) who explained the need for transportation for enhancing economic growth in terms of economies of scale of production where as Weber (1929) tried to explain this interface in the line of Marshall through the concept of agglomeration of different stages of production. On the other hand, central place development theory was

[3] Palatana Power Project is situated near Udaipur, the district head quarter of South Tripura, approximately 60 KM away from Agartala, the Capital City of Tripura.

propounded by Christaller (1933). Recently, Weisbrod (2007) explained this in terms of a business decision-making perspective and identify the mechanisms whereby transportation can affect supplier and buyer markets and costs, affecting the pattern and magnitude of economic growth among various industries and locations. Further, Economic development of any society is a complex process, which depends on several interacting forces. Perhaps one of the most important of these forces is the provision of adequate transport infrastructures. This is particularly true in the largely subsistence economy of most Asian and African countries where transport constitutes the key to development especially at the early stages of economic advance. Stuckey (1973) argued that transport facilitated economic advancement and transport improvement was indeed part of the economic advancement. A certain percentage of the economic activities arose directly because of new transport possibilities but for the most part, new transport facilities enabled the expansion of local activity and the integration of previously isolated market. In the same line, Filani (1978) observed that the socio-economic development of any society depends on a large extent to the nature and structure of transportation network of the society. He also argued that transportation provides the arteries through which the economic life-stream of society flows-the people, information, raw materials and finished products which help to build and maintain the society. However, no society can exist above the subsistence level without a measure of improvement in its transport system.

In a review of Transport Strategy of the World Bank (2001); Venter et al (2003) and Maunder et al (2004) recognize the need to address more systematically access issues, especially for those who are mobility impaired. This is particularly the case for most of the Land Locked[4] countries who do not have any sea cost. As a result, in order to trade with the rest of the world, these countries must depend on the neighouring one or more countries for transit to reach the sea.

Arvis et al (2007) has pointed out that at present, about one out of five countries in the world is landlocked. The problem mostly affects the poorest countries: 20 out of 54 low-income economies are landlocked, with a majority of them in Sub- Saharan Africa; while only three high-income economies out of 35 are landlocked. Arvis et al further pointed out that nine of the

[4] Actually, there are 42 landlocked countries in the world today. Except for the relatively wealthy landlocked states in Western and Central Europe (for example, Switzerland, Austria, the Czech Republic, Hungary and Slovakia), the rest are all poor and 31 landlocked countries can accurately be classified as LLDCs. Sixteen of the LLDCs are also categorized as least developed countries (LDCs). In SAARC region, there are three LLDCs: Afghanistan, Nepal and Bhutan.

twelve countries ranked lowest on the 2002 Human Development Index are landlocked. Although landlocked developing countries represent 12.5 per cent of the world's land area and 4 per cent of the global population, their combined gross domestic product accounts for only 0.3 per cent of the total. Without direct access to the oceans, these countries must pay an average of 15 per cent of export earnings on transport; for some African countries it is as high as 50 per cent, other developing countries spend only 7 percent on such services and developed countries 4 per cent. The case of landlocked developing countries has naturally received special attention, including a specific set of development priorities which was reflected in the Almaty Conference (2003).

Variants of the new economic geography, new trade theory, neoclassical and endogenous growth theories have been applied to highlight the nexus between geographic location, trade and economic growth. Amjadi and Yeats (1995) point out that the incidence of transport costs fall heavily on the landlocked African countries since they have to adjust their selling price to world prices. Bloom and Williamson (1997) highlighted that the land locked countries are always experienced a weaker growth as compared to the other maritime developing countries. According to their estimates, sometimes it is reduced by 1.5% points as compared to the later which again supported by the study of MacKellar *et al* (2002). Therefore, landlockedness can be thought as raising import prices and reducing export revenues. It is one reason why Radelet and Sachs (1998) advocate the idea that a re-export model is extremely difficult to achieve in landlocked developing countries due to higher cost of intermediate products. Gallup, Sachs and Mellinger (1999) identified two reasons behind the disadvantaged position of landlocked countries which may be stated as: (i) Coastal countries may have military or economic incentives to impose costs on landlocked countries; and (ii) Infrastructure development across national borders is more difficult to arrange than similar investments within a country.

Limao and Venables (2001) estimate that the landlocked countries trade on average 30% less than coastal countries. In this context, MacKellar et al. (2002) explain the negative relationship between landlockedness and growth using a neoclassical theory. They highlight that crossing a border implies higher transaction costs due to customs and handling costs.

Dependence over the transit state necessarily implies high transaction costs (notably transportation costs). In this regard, UNCTAD (2002) identified the “Transit charges” like port

charges, road tolls, forwarding fees, customs bonds or transport quota restrictions. Hence, the impact of being landlocked is based on the idea of dependence over the transit state. It has produced two main corollaries: Firstly, dependence necessarily implies high transaction costs and Secondly, mitigating measures for landlocked countries which again leads to either adopting transit rules recognized by the international law or developing regional transport infrastructure.

While there is a consensus on the problems of landlocked countries, the analysis so far has mainly focused on their transport cost disadvantage. Transport costs however account for only part of the real cost of being landlocked as they do not account for the transit delays and unpredictability which are critical in international trade. In the literature, macro-data are usually used to estimate the transportation costs burden. Radelet and Sachs (1998) find these costs to be about 50% higher for landlocked countries. Stone (2001) using the ratio of 'freight payments as percent of total imports' shows that landlocked developing countries, especially in Africa, bear exorbitant transport costs: out of 15 landlocked African countries, 13 had a ratio higher than 10% and for 7 the ratio was even higher at 20% as compared with 4.7% for industrial countries and 2.2% for the US. However, Arvis (2007) questioned about the notion that costs of transportation supported by developing countries are intrinsically high. Neither the distance covered, nor the unit cost of transportation services, are necessarily much higher in landlocked developing countries than in the wealthiest countries. Yet there are significant variations; for instance, Central and East Africa have higher unit costs than the EU but this is not the case of South and East Asia or other sub-regions in Africa. Furthermore, transportation costs only explain one part of the real impact of being landlocked. Delays and even more importantly low degree of reliability and predictability of services create massive disincentives to invest and higher total logistics costs. Moreover, Arvis et al demonstrated in that study that the gap between landlocked countries and gateway countries may not be very high – if transport cost is the only parameter taken into account. Shippers in most African gateway countries already face high logistics costs when adding maritime transport, port charges (which can be ten times higher in some African ports as compared to ports in developed countries), and domestic transport (especially to/from remote areas, as is the case for several export crops). In Africa, many shippers in landlocked developing countries have the same charges to move goods from/to ports as shippers in the gateway country.

In order to remove the disparity of transportation facility among the member countries, particularly for the landlocked developing countries, Article V of the GATT 1994 (Freedom of Transit) provides for the freedom of transit of goods, vessels and other means of transport across the territory of WTO Members via the routes most convenient for international transit, without distinguishing between flag of vessel, origin, departure, entry, exit, destination, or ownership of the goods, vessels or other means of transport involved.

Freedom of transit and a viable Customs transit regime for international transit are both particularly important for landlocked developing countries, many of which are among the poorest of the developing countries with the weakest growth rates, and typically dependent on commodity exports or imports of intermediate goods. In this context, the Almaty Conference in August 2003 drew attention to the problem of transit for these countries and devised an action programme. Customs transit regimes usually tend to suffer from the same shortcomings as other Customs transactions. These include the lack of simplified and standardized Customs procedures, documents and data processing, publication of fees and charges, cooperation among national Customs authorities, adequate security measures to combat fraud and smuggling, risk management techniques, computerization and electronic messaging. Inadequate transport infrastructure, logistics, vehicle standards and container seals add to these problems.

However, to confirm smooth transportation from the gateway country to the landlocked one, transhipment instead of transit is a better alternative in reducing the extent of custom procedure as well as related data work. Since, Transhipments refers to the same inter-country passage using gateway country-owned transportation, whereas in transit, landlocked country –owned surface transport move through the transit from one end to the other. For example, Germany or Austria sends goods to Italy through Switzerland. Another instance of transit, Alaska dispatches goods to mainland US through Canada.

While the basic obligations in Article V aim at ensuring optimal conditions for transit, there are indications that, on the ground, real freedom of transit is often absent or compromised. The conditions of international trade and the requirements for transit have changed since Article V was originally formulated in the late 1940s, and comments from business, international organizations and WTO members, in particular developing ones, have suggested a number of obstacles and shortcomings in relation to transit.

This study shall attempt to enrich the existing literature by considering the pricing policy of transit route for land locked developing countries particularly for those counties which have more than one feasible transit gateway through the neighouring countries.

3. India-Bangladesh Relation and the Issue of Transit/Transhipments Route for North Eastern Region:

As mentioned earlier, partition makes the whole north eastern India a partially landlocked region. In real sense, it cannot be defined as a landlocked region. However, the chicken neck shaped geographic location coupled with the presence of hilly terrain across the region makes this a partially isolated region from its heartland. A tiny hilly state like Tripura always lies below the National growth rate of State Domestic Product. There may be several reasons behind this underdevelopment but, undoubtedly, lack of proper communication with the rest of the country as well as with the neighbouring north eastern states aggravates the problem. This may be identified as a pseudo landlocked region where being a part of the Indian territory this particular state is not landlocked in true sense but the feasible road distance from the nearest sea port i.e. Kolkata port is more than four times the Arial distance from the same, ultimately, makes this state economically landlocked.

Against this backdrop, the state Government of Tripura is continuously demanding the transit route through Bangladesh for inflow and outflow of Commodities from its heartland but they were not ready to do this because of possible threat of loss. Apart from this a debate has been raging in Bangladesh on whether transit facilities should be given to India or not through the land territory of Bangladesh. The main reason behind this debate is more of political in nature than that of pure economic logic. Some argue that what India is demanding is some kind of rights on the territory of Bangladesh to move goods and people from the western part of India to its landlocked north eastern region and hence, they try to solve some of the core bilateral issues with India before giving this type of facility. The other groups are advocating this transit issue as an economic issue for trade facilitation and should not be politicized. Whatever be the view, it is fact that transit issue is a complex one and multi-faceted issue. The ambiguity arises due to two concepts: corridor versus transit. In the corridor, a country gives some kind of rights or control on the land to the other country making it a defacto of its territory, while in transit there is no

question of rights involved in the land territory allowed for transit. It provides only transit facilities under certain conditions and can be withdrawn. On the other hand, transit, an inter-country passage (like waterway-transit already provided to India since 1972), where India wants to dispatch goods and other materials from western parts of India to its seven land-locked north eastern states through Bangladesh and no kind of rights exists on the land territory of Bangladesh.

3.1 Bilateral vis-à-vis Continental Transit Issues:

Geographically, Bangladesh has some natural monopoly in this particular issue. Now the question is why Bangladesh was reluctant to permit such facilities to India. Being the natural monopolist in this particular issue, it tried to solve some basic bilateral issues with India. Two major bilateral issues can be identified in this case. Firstly, it wants similar transit facilities from India to access Nepal and Bhutan. These landlocked Himalayan countries are geographically quite close to Bangladesh but they are surrounded by India. Nepal and Bangladesh are separated by a narrow piece of Indian Territory of about 15 kilometres in the southeast. Had there been transit facilities (Nepal-India- Bangladesh), landlocked Nepal (so is Bhutan) could use Chittagong and Mongla port of Bangladesh that could cut down its transportation cost dramatically and one could see better trade and tourism relations between these two countries. Secondly, Bangladesh's export to India accounts for less than seven percent of its total import from the latter. As a result, it has a massive trade deficit with India. Moreover, large volumes of informal imports from India cross the land border avoiding Bangladesh import duties. There are allegations from Bangladesh that its products often face India's non-tariff barriers and other bureaucratic hurdles. But the Trade Complementarity Index shows that trade complementarity between Bangladesh and India is very low (5.42). This is due to less diversified export basket of Bangladesh for India as well as the later country is highly concentrated on readymade garment product which is not a significant import item for India. On the other hand, India has a broad export basket and close geographical proximity which, in turn, has helped Bangladesh to source for many commodities and final products with comparatively cheaper price. Hence, until and unless these complementarity issues are not overcome, it is hardly possible for Bangladesh to redress such imbalances. Though, in recent years, trade barriers have declined, both in

Bangladesh and India, in line with their commitments to World Trade Organization and South Asian Preferential Trade Arrangement (SAPTA). Moreover, India has given preferences to Bangladesh on approximately 2,925 tariff lines under SAPTA. However, these two bilateral issues have already been solved through a bilateral treaty between them.

From the above analysis, it seems that Bangladesh was not fully reluctant to allow India to use its territory to access northeast India but what it wants is a continental transit facility, especially in the southern part of the SAARC region (Bangladesh-India-Nepal-Bhutan) which does make more economic sense. The deadlock on transit issues has been costing India and Bangladesh's transport and other communication links. There is an overwhelming consensus that, to integrate South Asia with southeast- and other parts of Asia, there is a need for greater transport network across Asia. But India and Bangladesh have significant differences on the selection of the Asian Highway Network (AHN). Bangladesh opposes the proposed route (India-Bangladesh portion) that enters into Bangladesh from India and goes back into India. Bangladesh wants to initiate a route that connects it with Southeast Asia as well going through Chittagong and Myanmar, as the proposed route, as it argues, will virtually become a transit route for Indian goods between rest of India and northeast India. For this, Islam S (2010) commented that Bangladesh always tried to maintain this natural monopoly situation in order to solve all its bilateral issues with India in a single package. Indeed, this is one of the reasons why the tripartite gas pipeline project (Myanmar-Bangladesh-India) had not implemented finally.

Here, Bangladesh is always contemplating the transhipment/transit issues with Nepal and Bhutan but Myanmar was not ready to accept the proposed AHN route through Myanmar-Bangladesh-India route rather they are more interested to propose this route in Myanmar-North Eastern India-Bangladesh-India line. Once, the role of Myanmar is incorporated in this game, the relative advantage of Bangladesh will turn into potential disadvantage when the later are not ready to provide transit/transhipment facility for north eastern region of India. Another, major issue in this context is to determine the pricing of such transit/transhipment route. Since, transporter country India will utilise the transport infrastructure of Bangladesh, India has to pay the requisite fees or in other words, how much price Bangladesh can charge at most to provide such transit/ transhipment facility through its own territory. To answer these questions, we consider the following model to determine the optimal pricing of such route in the situations: (1) Bangladesh

Route is the only available alternative; and (2) Myanmar is also interested in providing transit/transhipment facility to India for its North Eastern region.

4. Model:

When the Myanmar Route for transit/transhipment was not available, the Transit/Transhipments Route through Bangladesh was the only available alternative to avoid the staggering transport cost to ship the commodities from hinterland to its north eastern counterpart. Obviously, in the absence of a land transit link between India and Bangladesh, the traffic between Kolkata and Assam is mainly carried by rail and road links through the *Siliguri Corridor* and the requirements of additional transport costs for carrying goods is staggering. To transport goods to and from the northeast through the corridor, the Indian government provides 25 percent transport subsidy. It is estimated that seven billion Rupees are being spent as additional costs to transport goods and services to and from northeast India. The figure is estimated in 1990s and it is expected that the cost has increased in tandem with economic growth both in northeast India and the rest of India. As such, as a transit route through Bangladesh can integrate the northeast India with its mainland and is set to reduce transportation cost significantly. In order to alleviate this problem effectively, evaluation studies must be performed in order to invest limited resources for maximum social benefits.

Assumptions: Four fundamental assumptions are made in this model:

(1) Here, Transhipment route itself is treated as tradable commodity;
(2) Amount of Transhipment is measured in terms of total amount of cargo movement from Kolkata port to Agartala during that period;
(3) The transit/transhipment proving countries are non-cooperative in nature; and
(4) All cargo may not be homogeneous.

The last assumption needs to be explained in detail. Apart from providing transit route through their own territory, both the gateway countries have some export basket for India. Hence, any cargo containing readymade garments originating from Kolkata port towards Agartala can hardly get any passage through Bangladesh because this item is one of the most important exportable

items for Bangladesh. But the same cargo can easily reach Agartala through Myanmar route. Similarly, any cargo containing rice can hardly expect to get passage through Myanmar though it can reach Agartala via Bangladesh. In this sense, it is assumed that all cargos are not homogeneous.

Notations:

tjI: Actual Average transportation cost per unit from Kolkata Port to Guwahati at par with the all India level;

tjB: Average transportation cost per unit from Kolkata Port to Agartala via Bangladesh Route;

tjM: Average transportation cost per unit from Kolkata Port to Agartala via Myanmar Route; and

tjA: Actual Average transportation cost per unit from Guwahati to Agartala via the existing Route;

Xj: be the total unit of cargo to be transhipped.

Further, we assume that (tjI, tjB, tjM) < tjA. Otherwise, the issue of transit or transhipment through the neighouring counties will not arise.

But, tjB>=< tjM

It may be noted that the normal transportation cost is assumed to be included in the cost schedule in contemporary economic literature. Hence, if the producer operates under break even situation then they hardly find any inducement to sell their products beyond Guwahati market due to this extra cost burden above its normal level. Simply, due to this adverse geographical locational problem, the transport subsidy for this region is staggering.

If, T^i be Total Transportation Cost to Agartala from Kolkata port via i^{th} Route; for all i= I, B and M. accordingly, the total transhipment costs to Agartala through the alternative routes are as following:

$T^A = \sum_{j=1}^{n}(tjA + tjI).Xj + 0 > 0$----------Equation (1)

$T^B = \sum_{j=1}^{n} tjB.Xj > 0$----------Equation (2)

$T^M = \sum_{j=1}^{n} tjM.Xj > 0$----------Equation (3)

From where, assuming T^A be the upper limit of total transport cost to Agartala from Kolkata Port through conventional route, the net gains from providing transhipment facility to Agartala may be written as:

Net gains for Bangladesh = $T^A - T^B = \sum_{j=1}^{n}(tjA + tjI - tjB).xj$----------Equation (4)

Net gains for Myanmar = $T^A - T^M = \sum_{j=1}^{n}(tjA + tjI - tjM).xj$----------Equation (5)

The right hand sides show the individual net actual gains beyond its normal level from providing transhipment facility to Agartala by the Country through which the transhipment takes place.

Hence, $tjB >=< tjM \Leftrightarrow \sum_{j=1}^{n}(tjA + tjI - tjB).Xj <=> \sum_{j=1}^{n}(tjA + tjI - tjM)Xj$------Equation (6)

Moreover, it may be noted that from Equations (1) and (4),

$T^A = \sum_{j=1}^{n}(tjA + tjI).Xj$

Or, $T^A = \sum_{j=1}^{n}(tjA + tjI + tjB - tjB).Xj$

Or, $T^A = \sum_{j=1}^{n} tjB.xj + \sum_{j=1}^{n}(tjI - tjB).xj + \sum_{j=1}^{n} tjA.xj$ ----------Equation (7)

Similarly, from Equations (1) and (5),

$T^A = \sum_{j=1}^{n} tjM.xj + \sum_{j=1}^{n}(tjI - tjM).xj + \sum_{j=1}^{n} tjA.xj$ ----------Equation (8)

i.e.

[Actual Transportation Cost to Agartala] =

- [Actual cost of Transhipments Though Foreign Country]
- +
- [Net Loss Due to Intra Regional Strategic disadvantage]
- +
- [Net Loss Due to Inter Regional Strategic disadvantage]

This has been depicted in the following figure showing the alternative routes.

Case1: Bangladesh alone provides Transhipments Facility for Agartala

The Demand function for cargo through the Bangladesh transit route may be considered as:

$tjB = B - b.Xj$----------Equation (9)

Where B>0 is the intercept and b>0 is the slope coefficient of the demand function thereby confirming the negatively sloped demand curve.

The Cost structure may be considered as: C_B= Fb-C1.Xj----------Equation (10)

Where again, F>o denotes the Fixed cost and C denotes the Marginal Cost

Hence, under monopoly situation, $Xj* = \frac{B-C1}{2b}$----------Equation (11a)

Accordingly, $tjB* = B - C1.Xj*$----------Equation (11b)

Hence, equilibrium may be achieved by equating Equations (7) and Equation (8),

Case2: Transit through Myanmar is also possible (Case of Differentiated Bertrand Competition)

We retain the same demand function with $Xj = XjB + XjM$. Hence the demand fuction appears to be:

For Bangladesh: $tjB = A1 - a1.tjB + b1.tjM$----------Equation (12a)

For Myanmar: $tjB = A2 - a2.tjM + b2.tjB$----------Equation (12b)

Where (A1,A2)>0 are the intercepts term and a1,a2.b1,b2)>0 are the slope coefficients of the demand functions thereby confirming the negatively sloped demand curves for each country.

Accordingly, the cost functions may be assumed as:

For Bangladesh: C_B= Fb-C1.XjB----------Equation (13a)

For Myanmar: C_M= Fm-C2.Xj_M----------Equation (13b)

Similarly, Where again, F>o denotes the Fixed cost and C denotes the Marginal Cost, respectively, for each country.

Under non-cooperative type situation, the optimal amount of transshipment through different routes found to be as following:

tjB**= $\frac{2(A1-C1)a2+(A2-C2)b2}{4a1a2-b1b2}$ and tjM**= $\frac{2(A2-C2)a1+(A1-C1)b1}{4a1a2-b1b2}$ ----------Equation (14)

From these, we can calculate, XjB**and XjM**----------Equation (15)

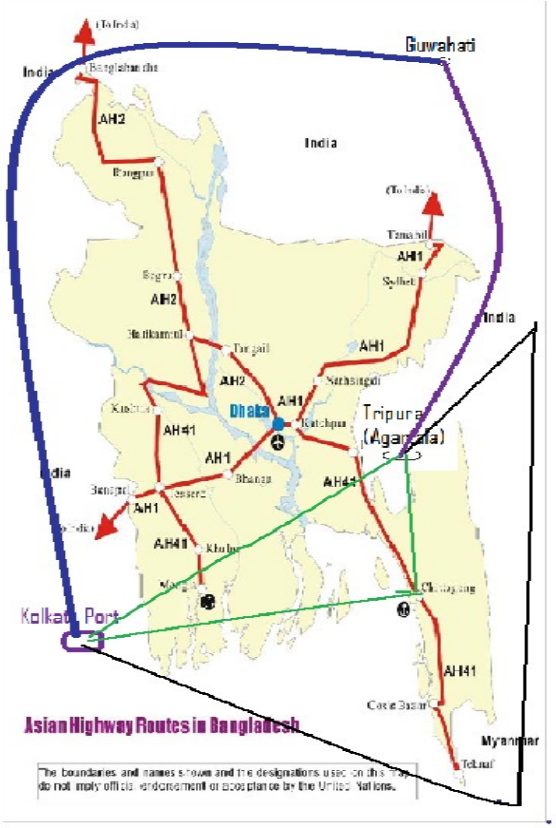
From the above analysis, it is clear that, transit/ transhipment facility cannot solve the whole transport disadvantage for India. But, under continental transhipment, India can substantially reduce its inter regional disadvantage substantially and there is a possibility that the intra regional loss will also reduce from its present level. Transhipment alone cannot solve the staggering transportation cost burden but undoubtedly, the extent will reduce from its present level. Simultaneously, the transhipment providing countries like Bangladesh and Myanmar will gain significantly in terms of derived demand of Transport infrastructure and allied sectors. Further, this continental transport network can lead towards integrated transport network for this region.

5. Conclusion:

Though Bangladesh is suffering from mounted trade deficit with India but a close look towards its deficit component clearly shows that it is net importer in multiple dimensions so far as the western side is considered. At the same time, it is a net exporter to India if its trade statistics is considered, it enjoys trade surplus with the north eastern region. Due to this strategic advantage, Bangladesh has some specific interest for trade with this region. Initially, Bangladesh was hesitating to allow India to provide transhipment facility for the north eastern region but India reciprocate it in right direction by providing similar transit facility to Bangladesh to reach the Himalayan landlocked countries like Nepal and Bhutan, thereby, actively participate in moving towards an integrated transport network for this region as a whole. Opening of Myanmar route

further gives India some relief in term reduced transportation cost due to both inter and intra regional disadvantage for the landlocked state like Tripura.

Appendix: Map of the Transhipment Route from Kolkata Port to AgartalaNote:N



Note: The Transhipment route is prepared on the basis of route map of Asian Highway Network in Bangladesh.